

THE ALGAE OF ST. PAUL ISLAND¹

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(Plate 208)

WHILE on a month's expedition to St. Paul Island with Miss Lily Perry during the summer of 1929, the writer undertook to make a collection of the marine algae. Very little attention has been given to the algal flora of the Canadian regions and the idea is current that it is of little interest. That of St. Paul revealed more of variety than would perhaps be anticipated.

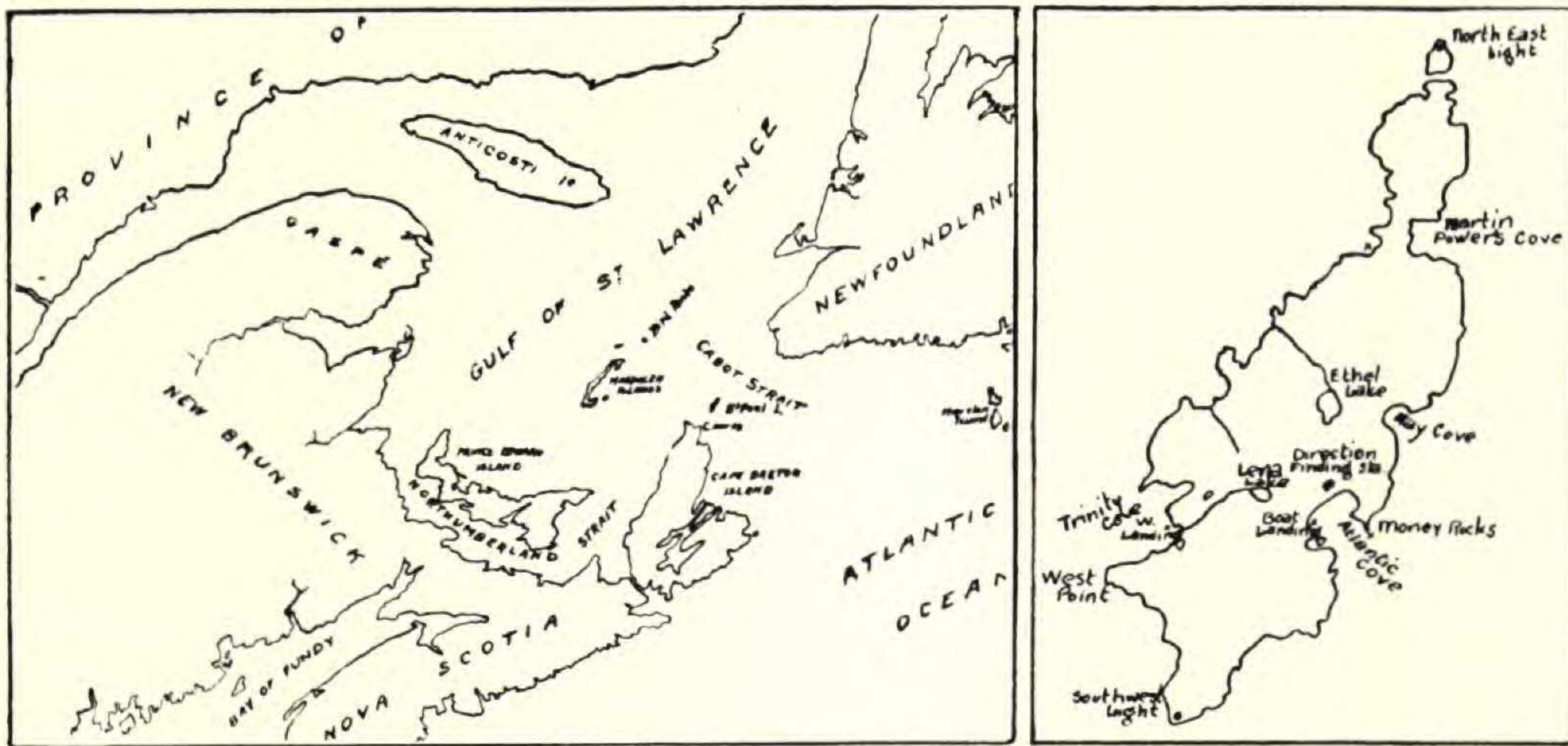


FIG. 1 (left). Gulf of St. Lawrence, showing location of St. Paul Island (in Cabot Strait). FIG. 2 (right). St. Paul Island.

St. Paul is a small island lying in Cabot Strait some twelve miles north-east of Cape North, the most advanced outpost of Nova Scotia (FIG. 1). It is about fifty miles distant from Cape Ray, the nearest Newfoundland point. Since it lies in the pathway not only of all boats passing up the St. Lawrence from southern ports, but also of European liners at those seasons when the Strait of Belle Isle is not a feasible route, this island has acquired much importance in navigation. From the earliest history of St. Lawrence shipping it has proved a menace to ocean traffic. Thus, very early, the Canadian Government established two light-houses on the island as well as a fog alarm and a well-equipped life-station. In 1924 the latter was replaced by a direction-finding station.

With an extreme length of no more than four miles and a width

¹ Contribution from the Department of Botany, Acadia University.

which varies from one-half a mile to a mile, the island has no claim to size. It rises abruptly from the ocean bed from depths of about 250 fathoms. The shore line is characterized by formidable cliffs which rise perpendicularly to heights varying between 50 and 100 or even 150 feet. These form in general an insurmountable barrier to land approach. West Landing in Trinity Bay and the Boat Landing in Atlantic Cove are exceptions (FIG. 2).

The entire island is rough and bold, with the highest of its hills, Mt. Coggin, reaching a height of 550 feet. Perched high above sea-level and shut in among the hills are two bodies of water known as Ethel Lake and Lena Lake. Streams forming outlets from the lakes are surprisingly small. Thus the main outlet of Ethel Lake leading to the west side of the island was found to be, even at its source, little more than a foot in width. A second outlet, the tiniest of streamlets, drained eastward and eventually trickled over the rocky precipice at Kay Cove. As a whole, natural drainage of the island is slight and the water for the most part is retained in the soil which is a thin, superficial covering over the huge rock. It was thus an anomaly to find an island with such steep inclines and an abundant supply of water and yet with so little opportunity for its escape.

The island suffers all the rigors of climate which its location would suggest. Dense fogs, high winds and severe winter storms are its lot. During the winter months, the drift ice of the St. Lawrence very effectively shuts it off from communication with the mainland. This pan ice is in cakes about six feet in thickness. Its effect upon the algae is conjectural, but doubtless it quite effectively scours off and removes at least the intertidal zone forms.

The temperature of the surface waters in these regions ranges from 55 to 65 degrees fahrenheit in summer.¹ Since the St. Paul spring tides are but four feet high and the neaps but three feet,² the exposure of algae at low tide is not great. There is an outward current from the Gulf which is here known as the Cape Breton Current and which attains a speed varying between $\frac{1}{2}$ knot and $1\frac{1}{2}$ knots an hour.³

Once arrived, it was apparent to us that the algae would be relatively inaccessible. In the absence of a boat, it was necessary to confine most of the collecting to two regions, Trinity Cove (at West Landing)

¹ The Currents in the Gulf of St. Lawrence. Dept. of Naval Service. Ottawa. 1913.

² Tide Tables for the Eastern Coasts of Canada for the year 1929. Dept. of Marine and Fisheries. Ottawa.

³ The Currents in the Gulf of St. Lawrence. Dept. of Naval Service. Ottawa. 1913.

and Atlantic Cove (at Money Rocks and the Boat Landing). A third region, on the west side of Martin Power's Cove, did not add anything to the collection made at the former points. A fourth collecting ground was the salt spray pools in the rocks at the North East Light. These slightly saline pools are at least 100 feet above the sea, and receive from the sea only the spray thrown up during very high storms. They yielded a rich growth of *Enteromorpha intestinalis* and also abundant mats of *Rhizoclonium tortuosum* and *R. riparium*, the latter a species not found elsewhere during the month.

It is apparent that the collections do not necessarily represent an inclusive list of the marine algae of the island. And yet, since the accessible regions were also in the most protected areas, it is felt probable that few forms escaped detection.

The most favorable place for algal growth on the entire shore appeared to be at Money Rocks (PL. 208, FIGS. 1 and 2). Here the large rocks project outward into the water in a gradual enough fashion to enable collecting to be done at low tide both from the outer rocks and in the inner tide pools. On the outer rocks, an abundance of *Scytosiphon* and *Chordaria* plants were clinging to the exposed faces. In the inner pools, several species of greens such as *Chaetomorpha Melagonium*, *Enteromorpha intestinalis* and *Rhizoclonium tortuosum* formed dense growths. In the outer deep channels, through which constantly surged even at low tide the strongest of currents, the hardy kelps found a favorable location.

Money Rocks, fortunately, is directly in front of the Direction Finding Station (PL. 208, FIG. 2) and since this was our headquarters for pressing and drying operations the proximity of the collecting ground was an asset. Collecting was expediated because confined to a small area. It was however rendered both difficult and hazardous by the roughness of the coast, the precipitousness of the rocks and even in the most favorable places by the strength of the local currents and the force of the waves.

Although the Money Rocks region was considered the best for variety of forms, the greatest abundance of any species observed was at the Atlantic Cove Boat Landing, where great quantities of *Chordaria* formed dense coverings over all the rocks. By far the best *Alaria* and *Laminaria* specimens were secured here in the wash after a heavy storm, and along with these were splendid specimens of *Agarum*. Since one expects *Fucus* and *Ascophyllum* in cold northern waters, the lack of any abundant growth of these was striking.

The only fresh water forms collected belong to the genus *Batrachospermum*. The abundance of *B. vagum* in Ethel Lake, where it formed a dense growth over the rocks in shallow water, calls for special comment. Also, a second species, *B. moniliforme*, was discovered in the streamlet draining into Kay Cove.

In all, some thirty-nine species and varieties have been identified as follows:

CHAETOMORPHA MELAGONIUM forma RUPINCOLA Aresch.

CLADOPHORA FLEXUOSA (Griff.) Harvey

CLADOPHORA RUPESTRIS (L.) Kützing

ENTEROMORPHA INTESTINALIS (L.) Grev.

RHIZOCLONIUM RIPARIUM (Roth) Harvey

RHIZOCLONIUM TORTUOSUM Kuetz.

SPONGOMORPHA ARCTA (Dillw.) Kützing

AGARUM TURNERI Post. & Rupr.

ALARIA ESCULENTA (L.) Grev.

ASCOPHYLLUM NODOSUM (L.) Le Jolis

CHORDA FILUM (L.) Stack.

CHORDARIA FLAGELLIFORMIS (Fl. Dan.) Ag.

DESMARESTIA VIRIDIS (Fl. Dan.) Lamour.

DICTYOSIPHON HISPIDUS Kjellm.

DICTYOSIPHON FOENICULACEUS var. AMERICANUS Collins

ELACHISTEA FUCICOLA (Vellay) Fries

FUCUS FILIFORMIS Gmelin

FUCUS VESICULOSUS L.

FUCUS VESICULOSUS var. LATERIFRUCTUS Grev.

FUCUS VESICULOSUS var. SPHAEROCARPUS J. Ag.

LAMINARIA DIGITATA (L.) Lamour.

LAMINARIA SACCHARINA (L.) Lamour.

LEATHESIA DIFFORMIS (L.) Aresch.

PYLAIELLA LITTORALIS (L.) Kjellm.

SACCHORIZA DERMATODEA (De la Pyl.) J. Ag.

SCYTOSIPHON LOMENTARIUS (Lyng.) J. Ag.

AHNFELTIA PLICATA (Huds.) Fries

BATRACHOSPERMUM MONILIFORME Roth

BATRACHOSPERMUM VAGUM (Roth) Ag.

CERAMIUM RUBRUM (Huds.) Ag.

CHONDRUS CRISPUS (L.) Stack.

CORALLINA OFFICINALIS L.

HALOSACCION RAMENTACEUM (L.) J. Ag.

PHYMATOLITHON COMPACTUM (Kjellm.) Fosl.

POLYSIPHONIA URCEOLATA (Lightf.) Grev.

POLYSIPHONIA VIOLACEA (Roth) Grev.

PTILOTA PECTINATA (Gunner) Kjellm.
 RHODOMELA SUBFUSCA (Woodw.) Ag.
 RHODYMENIA PALMATA (L.) Grev.

In addition to *Spongomorpha arcta* of usual size and appearance from the rocks at the Boat Landing, some specimens with filaments 100–150 micra broad and 7–8 cm. long were obtained in the wash at Money Rocks. The *Rhodomela subfusca* was not altogether characteristic. Howe indicates that “it leans a little toward the variety *gracilior*.” It was not anticipated that any *Polysiphonia* would appear in the region. Although not abundant, the specimens of *P. urceolata* and *P. violacea* denote that the genus is at least represented.

I am grateful to Dr. W. R. Taylor for checking the collection and for his assistance in identifying some of the more difficult species. I am indebted also to Dr. Marshall A. Howe for final determination of species of *Phymatolithon*, *Spongomorpha* and *Rhodomela*.

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ANOTHER STATION FOR *PANICUM CALLIPHYLLUM* ASHE.—On July 29, 1928 I accompanied Mr. Clarence H. Knowlton in a short botanizing trip around East Weymouth, Massachusetts, one of several trips that summer, where I benefited greatly by his expert guidance. One of the areas explored was composed of innumerable tongues of salt meadow, from which rose steep little wooded ridges, with a distinctly richer, less sandy soil than the prevalent type along the South Shore. On one of these steep hillsides in dense shade, we happened to notice a good sized patch of a large *Panicum*, which struck us as not being “quite right” either in appearance or habitat for *P. clandestinum*, and after some discussion as to what it might be, specimens were collected on general principles. That night while putting the day’s collection in press, I was surprised to be quite unable to “key” the grass in either Gray’s Manual or Britton and Brown. One day last spring I brought a package of such puzzles to the Gray Herbarium, where, however, my labors were shortened by the kindly interest of Professor Fernald, who with his usual acumen named it offhand as *Panicum calliphyllum*.

This species of *Panicum* has been collected on a very few occasions only, Ontario, once; Ohio, once; central New York, once or perhaps